

ÖBB-Infrastruktur AG

We want to get as many people as possible excited about railway travel!



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Invasive alien plants – A green tsunami

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2. Distribution of invasive alien plants along the railway network
3. Control measures – trail and error at ÖBB-Infra AG
4. Back up – further information



Railway tracks and their embankment acc. to the Austrian Railway Law

Hazard-zone acc. to austrian railway-law §19, 43 and 45

Safety-distances

Ban on building acc. austrian
railway-law §42

Bauverbotsbereich
12,0 m

Bauverbotsbereich
12,0 m

max. Baumhöhe

max. Baumhöhe

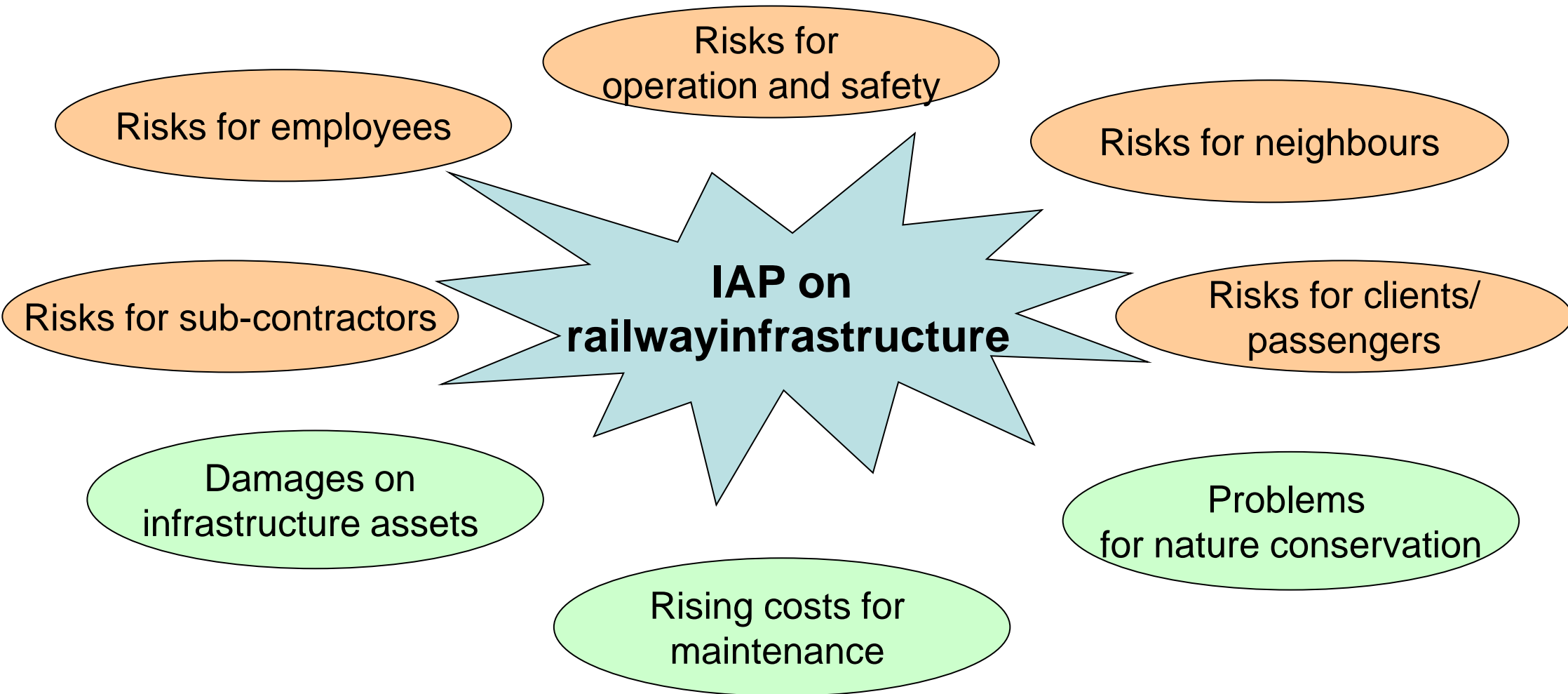
Track area – transportfunction
No vegetation!

Transition
area

embankment area – multiple functions
(ecosystem services, habitat, stepstone
biotope, landscape, recreation, etc.)

Hazard-zone acc. to austrian railway-law §19, 43 and 45

Invasive alien plants (IAP) – a growing challenge



Estimated damage in Europe: ~ 12.500.000.000 €/a

Invasive alien plants (IAP) – a growing challenge

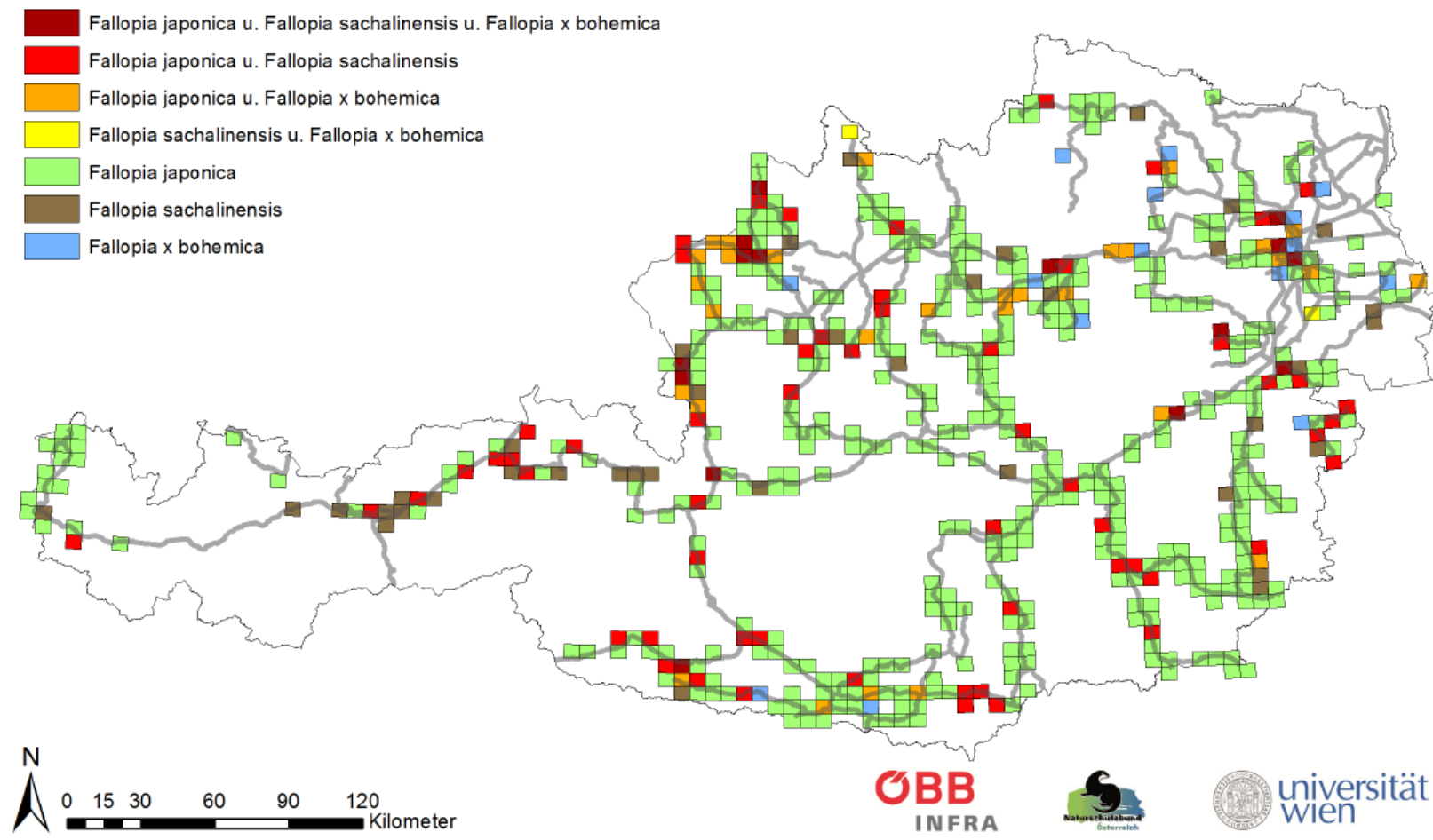
- Info-leaflet with practical hints and accompanying campaign
- Training & awareness rising – internal training seminar rail-ecology, environmental consultants
- Cooperations with Uni. Innsbruck, environment agency austria, federal forests, etc.
- Registration form for the documentation of IAP sites
- GIS - data
- Integration into relevant internal regulations
- Partner in R&D projects, e.g. biolog. eradication of tree of heaven
- Evaluation of mechanical, biological measures
- Eradication from ecological compensating areas and in case of danger for employees, contractors, clients, passengers, or neighbours



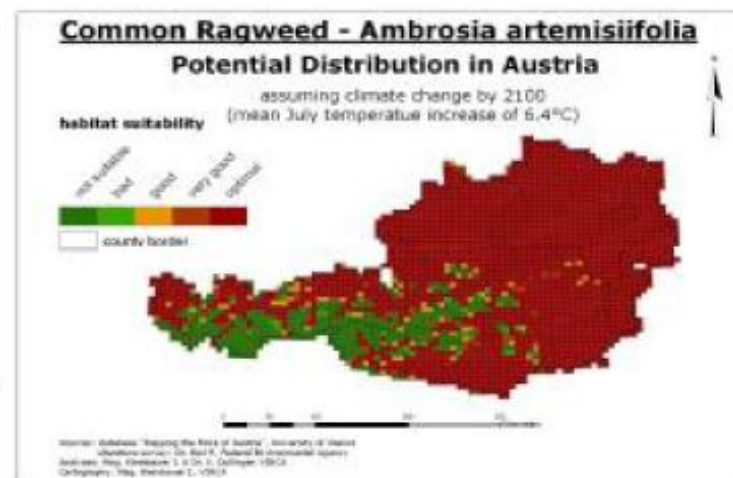
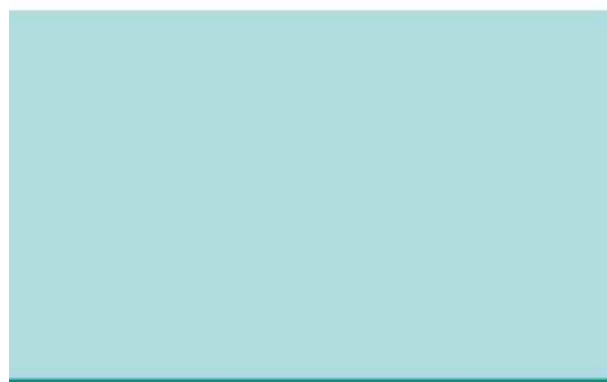
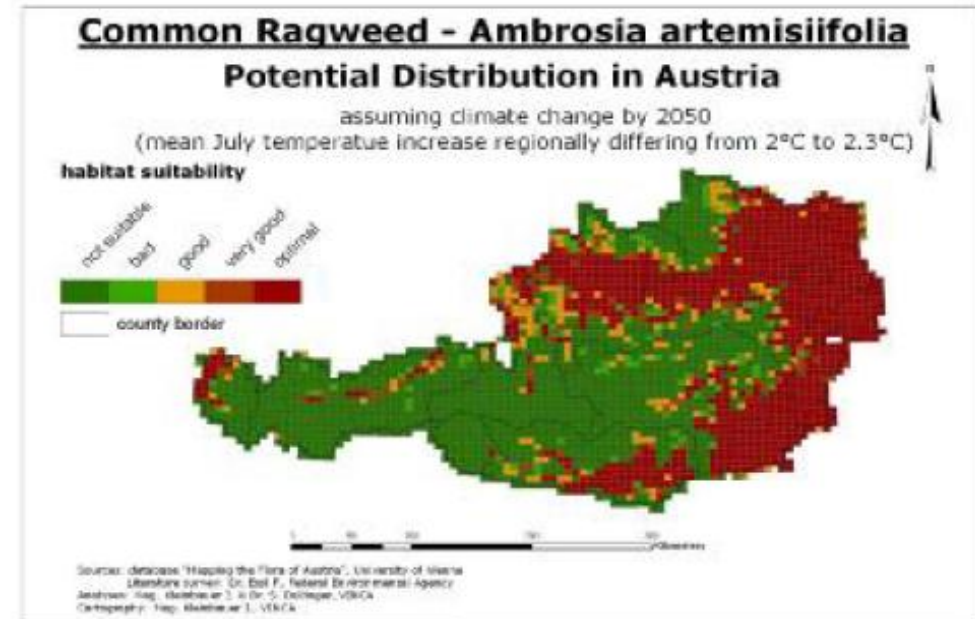
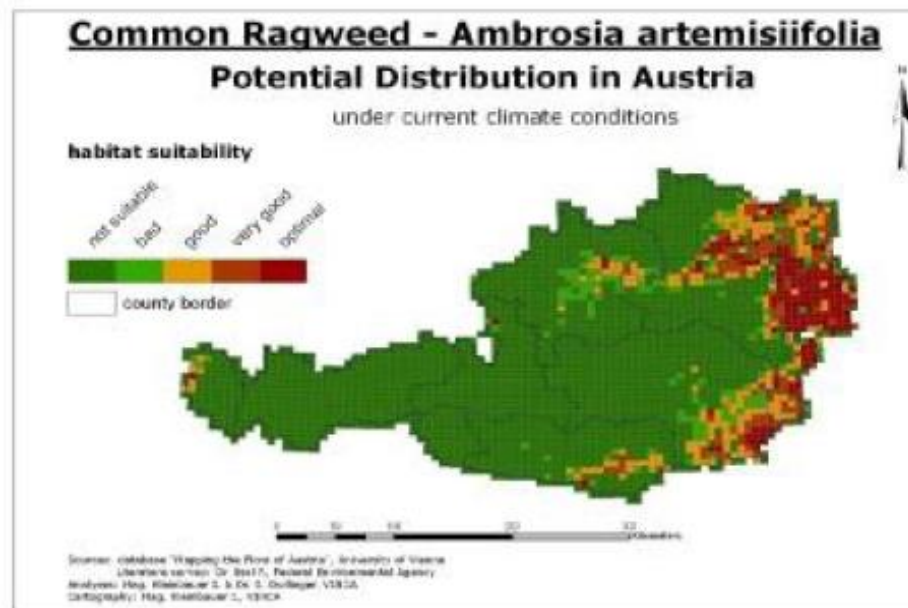
Distribution of the Japanese Knotweed

Data from the fieldmapping of the flora of Austria (gridsize: 34-35,5 km²) was overlapped with GIS data from the austrian railway network.

Trend: IAP are expanding rapidly



Climate change is providing the ultimate boost



Environment Agency Austria

www.umweltbundesamt.at

Alternative control measures – war on fallopia

Good results on weeds
in sealed areas

Trials with hot water (98°C, low pressure)
wave

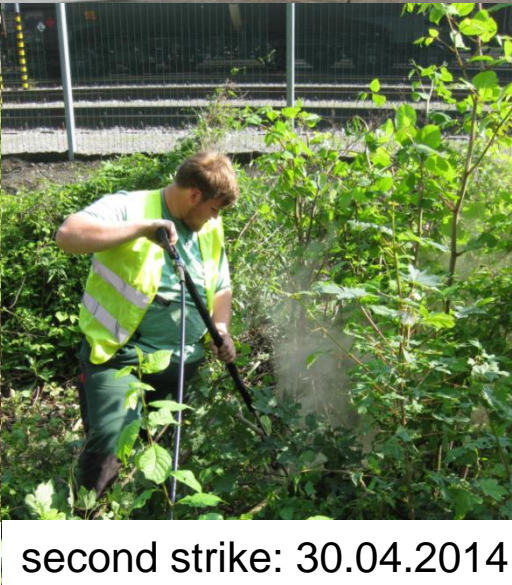
<http://www.waveunkrautbekaempfung.de/>

Application with a lance to damage the
roots.

Results: needs a lot of resources
(manpower, energy, equipment, money)
for insignificant effect!



first strike: 24.04.2014



second strike: 30.04.2014



third strike: 13.05.2014



14.08.2014

Alternative control measures – war on fallopia



Railway dam, overgrown by Fallopia sp.,
May 2014

Expected effects: mechanical
damages, constriction of stems,
degradation
growth of competitor-vegetation

Trials with steelgrids (6x6 and 10x10mm),
intensified mowing and grazing of goats
and sheep



Application of steelgrids, 10.04.2014

Alternative control measures – war on fallopia



Damage by late frost on 9. May 2014

Trials with steelgrids (10x10mm),



Recovery on 28. May 2014



Constriction of
stems. Gridsize
10x10mm May 2014



Alternative control measures – war on fallopia



Trials with steelgrids (6x6 mm),

Results: needs quite a lot of resources
(manpower, material, money)
for little effect so far!

Fallopia damaged by a hailstorm on 23 June 2014.
Fallopia covered by 6x6 mm steelgreed, seemed to be protected, but...

...could only develop
cripple-growth forms.



Alternative control measures – war on fallopia

Grazing with goats and sheep



13 goats and 4 sheep were put on a dam, appr. 7500m², start May 2014

Expected effects:

reduction and mechanical damages,
no problems with material disposal,
surface compression of the dam
growth of competitor-vegetation

classification: ÖBB-Infrastruktur AG/Stab BL (public)

Success factors:

motivated railway colleagues
cooperative, innovative farmer
animal friendly conditions (water,
shade, etc)
calm and healthy animals
internal and external communication

ÖBB-Infrastruktur AG/Th. Schuh

Alternative control measures – war on fallopia

Grazing with goats and sheep



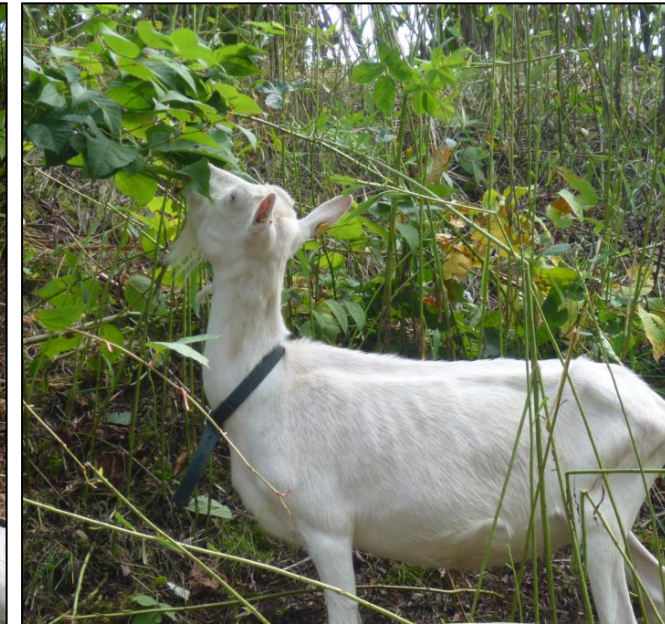
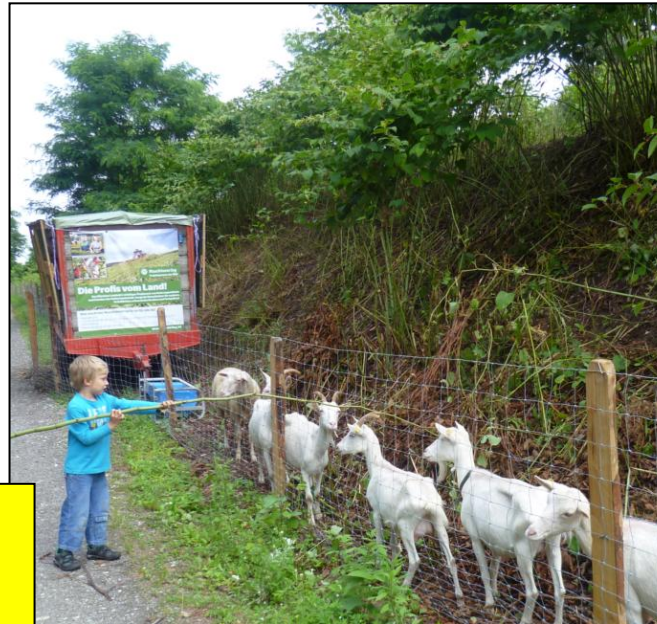
Summer 2015,
grazing makes the difference

18.07.2014

27.07.2014

Alternative control measures – war on fallopia

Grazing with goats and sheep



Results: needs quite a lot of resources (manpower, material, money specifically at the start!) for multiple effects so far!

- Significant reduction of Fallopia and goldenrod, maybe also robinia
- Improved landscape scenery of the dams
- Very positive media reports
- Very positive feedback from the public
- Awareness raising of the staff and the public
- Creation of a local value chain for farmers

Alternative control measures

– biological control of tree of heaven



- Screening for candidates suitable for biological control of *Ailanthus* → First report of the wilt-causing pathogen *Verticillium nonalfalfae* in Europe isolated from *Ailanthus*
- *In-vitro* propagation of the pathogen and production of a spore suspension for artificial treatment
- Investigations on young and mature *Ailanthus* trees indicated high mortality of treated trees
- Comprehensive studies (starting 2011) concerning
 - dosage and formulation
 - appropriate application methods
 - optimal date of treatment
 - natural distribution of the pathogen
 - „non-target-effects“?

Effect on young Tree of Heaven

2013-07-19



2014-10-13



2014-07-24



2015_07_08





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viadonau



Esterházy





Thank you for your attention!

Invasive alien plants (IAP) – a growing challenge

So-called:
“siderodromophiles” IAP,
which are commonly found
on railways and are
spreading dramatically!



Tree of heaven (*Ailanthus altissima*)



Japanese knotweed (*Fallopia* sp.)



Robinia (*Robinia pseudoacacia*)

Invasive alien plants (IAP) – a growing challenge



Jewelweed (*Impatiens glandulifera*)



Canada Goldenrod (*Solidago canadensis*)

Invasive alien plants (IAP) – a growing challenge



Ragweed (*Ambrosia artemisiifolia*)

Giant Hogweed (*Heracleum mantegazzianum*)